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AN ADDRESS

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HEALTH AND EFFICIENCY.

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Coincident with the world's general progress, much has been done in recent years for relief from those conditions of environment that affect us unfavorably, for prevention of disease and physical suffering, for the promotion of longevity and happier conditions. Such work has made possible the building of the Panama Canal, and many other great achievements which could not otherwise have been accomplished.

SOME FUNDAMENTAL CONSIDERATIONS.

It is beginning to be understood and soon will be generally realized that much effort has been wasted in the past and much efficiency has been lost by lack of attention to industrial hygiene. Matters of this kind have been regarded as philanthropic, and therefore not to be considered in connection with business enterprise. As the business transactions of the world have for their object profit, any proposal is measured by finance. While the inspiration for the betterment of working conditions may have arisen from physicians and philanthropists, true economy has played a large part as the ultimate cause of sanitary reform and will continue to do so.

That it pays to safeguard a workman from loss of limb or other accident by covering gears or placing guard-rails about pulleys and belts is a conclusion that is obvious. Nevertheless until recent years but little had been done. Not so obvious but just as far reaching in its results is the safeguarding of employees against disease.

It is axiomatic that efficiency depends on health.

It is, therefore, of great commercial importance that workmen be surrounded with proper safeguards not only for

the prevention of accidents but also for the prevention of sickness, and that everything practicable be done not only to prevent disease but also to raise the standard of health to the highest point.

The health of any community depends on the health of its individual components. It depends therefore on the persons themselves, on those responsible in various degrees for the daily life and work in a community, and upon those who are responsible for the making and enforcement of laws.

So the responsibility may be divided under three heads:

1. Personal hygiene or care by employes of themselves;
2. Care by a company within its inclosure;
3. Care by authorities (town, city, state and national Government) in making and enforcing of laws.

While public hygiene can be enforced, personal hygiene is a matter that must largely be the result of education.

PERSONAL HYGIENE.

The care of the individual, those things which are largely under his control and which he should do for himself are: The regulation of his meals—the amount, character, and mastication of them; the amount and character of drink; hours of rest and sleep; ventilation of rooms; personal cleanliness, for clean bodies and clean clothes lessen the chances of blood poisoning in accident cases; washing of hands before meals; daily washing of feet; proper fitting of shoes; amount and kind of clothing, care of the eye, ear and nose; brushing of teeth; regularity of habits; the cultivation of cheerfulness—for the mind has much to do with the body and especially with tissue changes and secretions; regularity of work.

The first condition of health is fruitful toil. Work is not a necessary evil; it is our greatest safeguard against disease and advancing old age.

The individual should be taught that definite results are to be obtained from definite conduct.

It has frequently been asserted that a large percentage of accidents occurring about plants are due to fatigue. From observation and inquiry it would seem that the greatest

number of accidents are due to carelessness, some to ignorance, some to alcoholism, and other cases to a lack of proper guarding of machinery. Still fatigue must be considered.

The determinations of physiologists show that constant and rapid motion of a muscle produces fatigue by the accumulation of lactic acid and carbon dioxide within it.

It is, however, reasonable to suppose that fatigue is due not alone to accumulation of acid within muscles but also to a lack of carbohydrates caused by improper feeding, or to excess of alcohol, or to deranged metabolism—due to lack of oxygen, or to loss of sleep, or the condition of the skin, or the amount of fluid taken, or as the result of putrefaction in the intestines and the formation of certain aromatic bodies and absorption of them in the system.

If this be true, what a field of effort is opened to us for the study and correction of such conditions; how easily we see that loss of efficiency can be connected with matters of personal hygiene—how great the importance to both employer and employee of education in such matters.

SANITATION BY EMPLOYING COMPANIES.

Under the second head come those matters relating to health that should be worked out within the plants. Among these may be mentioned periodic physical examinations of employes; furnishing a wholesome supply of drinking water, with regulation of its temperature and method of distribution; adequate washing facilities; a sufficient number of properly constructed clean, light and well ventilated toilets; proper sewage disposal; good ventilation with prevention of fumes, dust and smoke, or proper disposition of them; clean floors and yards; proper methods of heating in winter and cooling appliances for heated work-places in summer; good lighting; provision for first aid; and possible consideration of lunch and rest rooms.

Among questions cognate to these are problems relating to hours of labor and periods of rest.

In many plants such matters as these have already been taken up with those in charge. In the building of plants it

is well to keep these things in mind, for if included in construction their cost would be less than if added later.

I cannot too strongly urge that when money is available for welfare or sanitary work it be spent first for the purposes just enumerated, rather than for the building of club houses or reading rooms, or for lectures, playgrounds, recreation centers, planting of trees, flower gardens, or visiting nurses. For, while these are all desirable in themselves and appeal to the general public, they are not by any means of first importance. Nor should the money be expended for the correction of town or city conditions, because these things should be the care of the body politic, the community as a whole.

Furthermore, one must keep in mind that work of such character must be limited, that too much paternalism is unwise and against public policy. What these limits are only the future can decide. At present the first consideration of each company should be the safety and health of the workmen within its plant.

SANITATION UNDER PUBLIC AUTHORITY.

This brings us to the third heading, the making and enforcing of sanitary laws by public authorities—the subject of this evening's paper.

A healthy organism can largely adapt itself to its surroundings, whether in the Arctic Circle or at the Equator; but it cannot adapt itself to bad milk from diseased cattle, impure food, polluted water, dirty streets, putrid garbage, fly-breeding manure heaps, mosquitoes, bad drainage, crowded sleeping rooms, foul air, and contagion.

The regulation of such conditions is chargeable not to employer or employe, but to the city, town or state as a whole. Such matters are as much the care of the public as are schools, fire, or police, and they should not be left to the haphazard of charity. Nor should they be left entirely to those whose duty it is to enforce the laws. These officials are oftentimes absolutely dependent for their daily bread upon the persons over whom they are called upon to exercise authority, with the result that the laws are but indifferently administered.

The losses entailed are largely calculable. When we consider the loss in wages, loss of time in school and cost to the State from lack of promotions, sickness in hospitals, drugs, doctors, nurses, undertakers, the effect on the family from the loss of the father, the wage earner, and a host of things too numerous to mention here, the economy of hygienic measures becomes apparent. But who shall measure the loss in efficiency of a workman if a member of his family is ill and his mind is not upon his work? How much also has this mental abstraction, due to anxiety, to do with accidents?

After long and careful study, I find that the proper standard of health—and, therefore, efficiency—cannot be maintained in the iron and steel and allied industries because of the lack of proper laws and the inadequate enforcement of existing laws by National, State and local authorities. Enormous sums of money are paid in taxes for which there is no adequate and proper return.

Health Departments are never fully equipped. Very few deserve the name, and some are simply a name. In the past, and even to-day in the majority of places, matters which pertain to public health and to hospitals have been and are largely matters of private charity.

SOME SIGNIFICANT FIGURES.

Death rates are falling wherever the mandates of hygiene and sanitary science are obeyed. While in many places much has been accomplished, other places are still in the condition of sanitation prevalent thirty years ago.

A study of causes of death shows that, in general, but 4% die from old age, 4% more from violence, while 92% die from disease. Of this last great group, nearly one half are due to diseases of environment; that is, to diseases which are the concern of health authorities, diseases which by proper supervision could be wholly eliminated. There is no necessity for deaths from typhoid fever, tuberculosis, or diseases of like character. They are wholly preventable.

The determination of the health necessities of communi-

ties is based principally on the death rates and general inspection. Taking fifteen of the principal towns visited for the Institute, excluding the large cities, the death rates averaged 19 per 1000—easily double what it should be and at least one third more than the rate of some cities of larger size.

For instance, Minneapolis with over 300,000 population has a death rate of 8.63 per 1,000, and even New York and Chicago with their dense and heterogeneous population have death rates of only 15.1 and 14.5 per 1,000, respectively.

The basis of sanitary work is registration of vital statistics. In not one state in the Union is there a complete registration of births, and fully one half of the country has no registration of deaths.

IMPORTANCE OF MILK SUPPLY.

Of the matters that need remedying by the authorities, certain things stand out more prominently than others. That which is pre-eminent—so far as it affects the growth, health and life of children in the home—is the condition of the milk supply.

This is a matter of vital importance. Not alone does it affect children, but it stands second as a cause of typhoid in adults. And, although the agitation for supplies of clean and wholesome milk has been going on throughout the country for several years, in many places nothing has yet been done.

In a number of towns where the industries connected with the Institute are located I have had occasion to visit some of the principal sources of milk supply and have found that they could hardly be worse. In cities advanced in matters pertaining to health, it is usual to mark the standing of dairies upon a score card on the basis of 100. Using such a card, some of the dairies visited scored 8 or 10, others 2 or 3, and to some I was unable to give a single point.

NEGLECT OF CONTAGIOUS DISEASES.

Again, among children it is noticed that the death rates from contagious and communicable diseases are high. It has been shown by records that such diseases are largely

spread through the medium of public schools. The approved method of control of such a condition is by a system of medical school inspection and proper quarantine and disinfection, and the reporting of cases by physicians. But such a thing as medical school inspection is almost unknown, except in a few large cities, and even there it is not practiced to its fullest extent, while quarantine and disinfection are largely left to the family physician.

In many instances, cases of contagious disease have no physician and are not reported at all, thus giving opportunity for the spread of disease to others.

Little or no provision has been made for proper care of contagious disease among adults.

Contagious disease hospitals are lacking everywhere. In two places visited it was noticed that school houses costing more than \$125,000 each had been erected, but at each place the contagious disease hospital (or, as they properly term it, "the pest house") cost only about \$125.

Further study of death rates shows that the mortality from tuberculosis and other diseases of the lungs is high. It takes but little investigation and study to find the principal causes. Among these is foul air.

CROWDING OF SLEEPING ROOMS SHOULD BE ABOLISHED.

Crowded sleeping rooms are found everywhere. It is conceded by sanitarians that the least possible space for each person in sleeping apartments should be 400 cubic feet, and the air should be changed hourly; yet almost everywhere workmen were found occupying much less space, frequently less than half that amount—with no windows open and no system of ventilation, with beds often continuously occupied by the interchanges of day and night shifts, those working at night taking the place in bed occupied by those that work in the day and conversely.

Metabolism—that is, the body processes and chemical changes that take place in the tissues—cannot be properly carried on under such conditions, especially the oxidative processes. So a lack of fresh air and the breathing of ex-

pired air in sleeping rooms, unfit a man for work. They cause a loss of vigor, lowered vitality, loss of appetite, anemia, and loss of resistance to disease.

Recent physiological research shows that under such conditions the body may not get rid of its heat, a feverish condition thus supervenes, and there is a consequent waste of fuel.

These crowded and ill-ventilated rooms were frequently found in the back of saloons or above them. Many workmen, in their desire to save, choose to board at such places, because board is furnished at the low rate of \$3.50 per week. With the present high cost of living, this appeals strongly to the single laborer, and the saloon makes its profit from the sale of intoxicants. The combination of alcohol and foul air readily accounts for disease.

In diseases of such character, early diagnosis is of prime importance. In lung diseases, the sputum must be examined microscopically. In the larger cities this is done by a bacteriologist at the expense of the City. The bacteriologist in connection with the Health Department diagnoses not only tuberculosis, but also diphtheria, typhoid and malaria. Such assistance is needed everywhere, but it is almost universally lacking.

BETTER MUNICIPAL WATER SUPPLIES ARE NEEDED.

In a large percentage of the plants, and in towns controlled by the industry, the drinking water supplies belong to the Companies themselves, and care has been taken to purify and protect such supplies. But in many of the towns visited, the town water was found polluted, and in others the water so unattractive by the amount of turbidity due to the mud and silt it contained, especially during the spring freshets, that it was useless even for washing, not to mention drinking purposes.

Inasmuch as typhoid, diarrhoea and dysentery are largely spread by polluted water, the necessity for better municipal water supplies is obvious.

Garbage is generally not collected and fly-breeding stable manure is permitted to be heaped up beside stables and in

back alleys throughout the year. Many towns are without sewers. Very few have any system of sewage disposal.

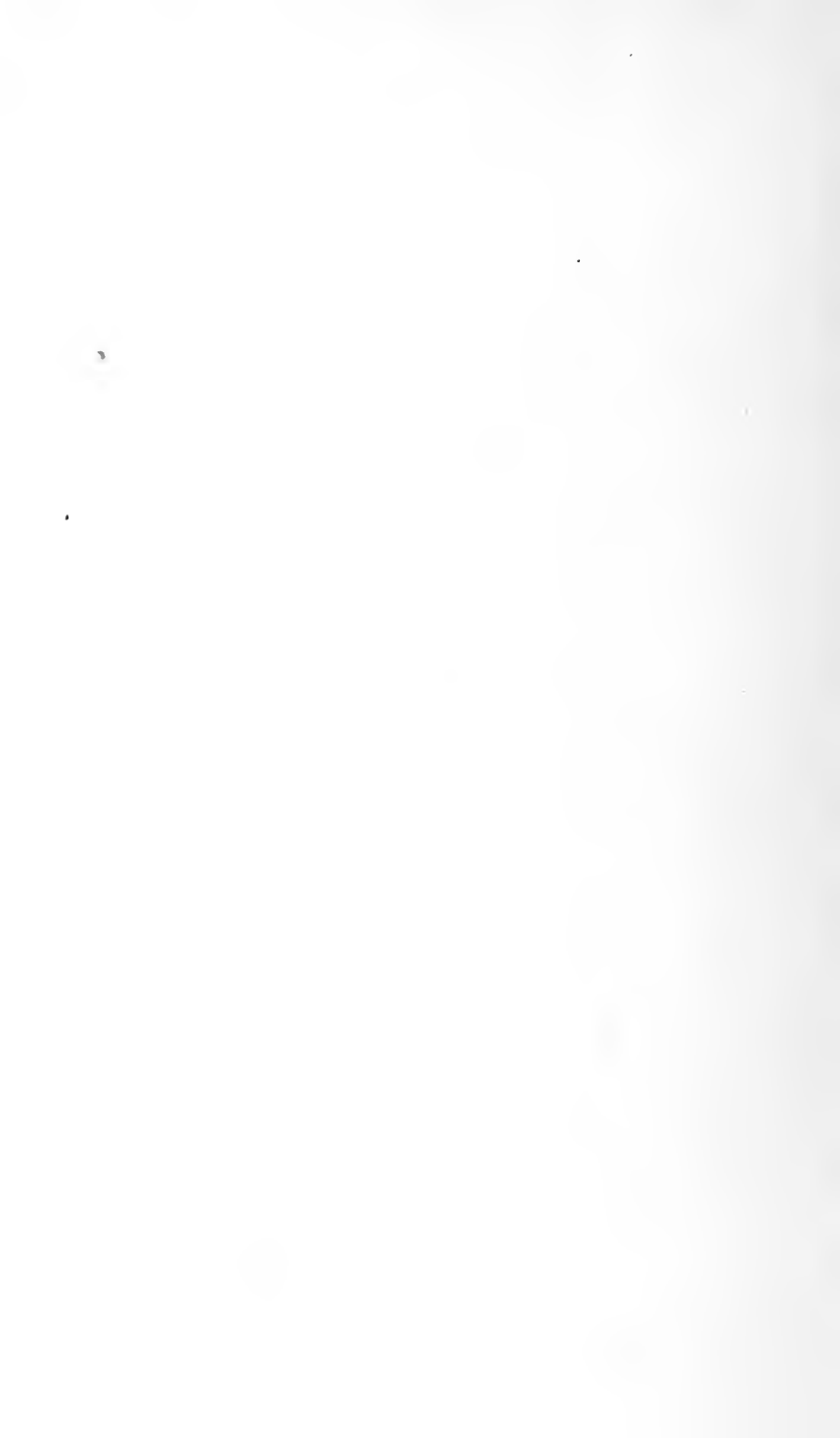
In a number of places where there are no sewers, cess-pools take their place. These are connected with limestone caverns, and no one knows where the sewage goes. It frequently happens that a neighbor pumps it up as well water.

So I repeat, not only conditions surrounding the man when he is at work must be guarded, but also those conditions surrounding him when away from work. Of what avail is the furnishing of wholesome water to the man when at the plant if he must take a polluted supply when he returns to his home.

SUMMARY.

Thus I might go on enumerating the various sanitary undertakings resting as a duty upon cities, towns and villages; but the instances I have given are enough to show the necessity for action. As large taxpayers those who manage and control plants should exercise their prerogative in demanding that public authorities perform their proper functions in promoting the health and happiness of the people.

Summarized, these duties well performed mean pure air, wholesome water, an uncontaminated food supply and relief from those factors that detract from physical comfort. They mean better work accomplished and thus economy to employing companies by increased industrial efficiency. They mean decreased loss of time due to preventable illness. They mean decreased death rate from preventable diseases. They mean prevention of the spread of communicable diseases. They mean betterment of living conditions. And finally, they mean contented workmen—and contentment is greatly to be desired.







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